

What is claimed is:

1. A purge valve in fluid communication between a fuel vapor collection canister and an intake manifold of an internal combustion engine, the purge valve comprising:

a body defining a fuel vapor flow path between first and second ports, the first port being in fluid communication with the fuel vapor collection canister, and the second port being in fluid communication with the intake manifold;

a seat defining an aperture through which the fluid flow passes in an open configuration of the purge valve;

a head including a permanent magnet, the head being attracted to the seat and occluding the aperture in a closed configuration of the purge valve; and

a solenoid being magnetically coupled to the head, the head being repelled by the solenoid toward the open configuration when the solenoid is energized, and the head occluding the aperture due to the magnetic attraction with the seat when the solenoid is de-energized.

2. The purge valve according to claim 1, wherein the solenoid comprises a stator including a passage through which the fuel vapor flow path passes in the open configuration of the purge valve.

3. The purge valve according to claim 2, wherein the stator comprises the seat.

4. The purge valve regulator according to claim 3, wherein the stator comprises a tube portion and a disc portion fixed to the tube portion, the tube portion defines the passage, and the disc portion defines the aperture.

5. The purge valve regulator according to claim 4, wherein the disc portion is integrally formed at a downstream end of the tube portion that is proximate the second port.

6. The purge valve according to claim 2, wherein the passage extends along an axis, the first port is concentrically aligned with the axis, and the second port is offset from the axis.

7. The purge valve according to claim 1, further comprising:
sonic nozzle defining a portion of the fuel vapor flow path between the aperture and the second port, the sonic nozzle maintaining a substantially constant mass flow in the open configuration regardless of vacuum changes in the intake manifold.
8. The purge valve according to claim 1, wherein movement of the head between the open and closed configurations excludes resilient biasing.
9. A fluid flow valve comprising:
a body defining a fluid flow path between an inlet port and an outlet port;
a seat defining an aperture through which the fluid flow passes in an open configuration of the fluid flow valve;
a head including a permanent magnetic, the head occluding the aperture in a closed configuration of the fluid flow valve, and the permanent magnet being attracted to the seat and biasing the head toward the closed configuration of the fluid flow valve; and
an electromagnet being magnetically coupled to the head, the electromagnet repelling the head toward the open configuration when the electromagnet is energized, and the magnetic attraction of the permanent magnet to the seat occluding the aperture when the electromagnet is de-energized.
10. The fluid flow valve according to claim 9, wherein movement of the head between the open and closed configurations excludes resilient biasing.
11. A method of controlling fuel vapor communication between a fuel vapor collection canister and an intake manifold of an internal combustion engine, the method comprising:
preventing the fuel vapor communication due to a permanent magnet being attracted to a seat, the seat defining an aperture through which fuel vapor passes, and the permanent magnet occluding the aperture;
permitting the fuel vapor communication through the aperture due to an electromagnet repelling the permanent magnet from the seat.

12. The method according to claim 11, wherein the permitting comprises the fuel vapor communication biasing the permanent magnet from the seat.
13. The method according to claim 11, further comprising:
excluding resilient biasing of the permanent magnet.